

4. On a new Genus, with four new Species, of Freshwater Prawns. By C. SPENCE BATE, F.R.S.

(Plates XXX. & XXXI.)

MACROBRACHIUM, gen. nov.

Carapace armed anteriorly with a vertically projecting rostrum.

Eyes with short peduncles, not concealed beneath the carapace.

Superior antennæ having the first joint of the peduncle caved upon the upper surface; second and third joints cylindrical. Flagella three-branched, the smallest branch united to the largest.

Inferior antennæ furnished with a large scale; flagellum long and slender.

Mandibles having a molar and an incisive process, and furnished with a triarticular appendage.

Gnathopoda pediform.

First pair of pereopoda slender, about as long as the carapace, didactyle; second pair immensely developed (in the male), longer than the entire length of the animal from the extremity of the rostrum to that of the telson.

Posterior three pairs simple, robust. Posterior pair of pleopoda longer than the telson. Telson triangular, terminating in a single point.

MACROBRACHIUM AMERICANUM, sp. nov. (Plate XXX.)

Carapace nearly half the length of the animal.

Rostrum short, armed above with eleven anteriorly projecting dental processes, of which the last four are posterior to the orbital margin of the carapace, and furnished with short, stiff hairs in the depressions between the teeth; below with three simple teeth. The rostrum has the anterior portion depressed, the apex being slightly elevated. Behind the margin, at the lower extremity of the orbit, is a single, sharply pointed tooth, behind and below which is a sharp spine or tooth that is surrounded at the base by a suture that passes from it on the anterior side to the anterior margin of the carapace.

Pleon deep, scarcely longer than the carapace.

Eyes globular. Superior antennæ having the peduncle scarcely longer than the rostrum; first joint half the length of the peduncle, inner surface flat, perpendicular, furnished with a single tooth near the centre of the lower edge, superior surface concave (for the lodgment of the eye); outer margin thinned out to a fine edge, furnished with a sharp, anteriorly directed tooth near the centre, and another at the distal extremity; the next two joints are short. The smallest flagellum united to the largest for about one-fourth of an inch from the base. Inferior antennæ having the peduncle about half the length of the superior. The large squamiform process nearly half as long again as the rostrum, furnished with an external subapical tooth. Flagellum about as long as the second pair

of pereopoda. Mandible having the incisive margin tridentate, the molar tubercle strong, prominent, and quadrate, and the triarticulate appendage not longer than the incisive process. Gnathopoda subequal, short, robust. First pair of pereopoda slender, having the carpus longer than the meros, and nearly four times as long as the propodos, smooth. Second pair of pereopoda half as long again as the entire animal, having the carpus shorter than the meros, and not half as long as the propodos; digital process turned inwards, armed within the centre with a large dental tubercle; dactylus meeting the digital process of the propodos at the extremity only, and armed near the centre with a large dental tubercle. The entire appendage covered with short spinous denticles, that are strongest on the inner surface and thickest on the digital process of the propodos, the dactylus, as well as the carpus, meros, and basal joints. Last three pairs of pereopoda robust, spinous along the surface of the carpus, propodos, and dactylus. Posterior pair of pleopoda having the outer ramus biarticulate, the margins round and smooth. Telson shorter than the posterior pair of pleopoda, furnished with a fasciculus of hairs near the base, and two sublateral dorsal spines beyond the centre.

This very interesting and, from its great size, valuable Prawn, was obtained by Mr. Osbert Salvin from the Lake of Amatitlan, whence a considerable number are procured and brought to the markets in Guatemala. Its length, from the tip of the rostrum to the extremity of the telson, is about 9 inches; and in diameter it is about 5 inches. The length of the great claws is a feature that must separate this from the genus *Palamon*, from which it is also distinguished by its less slender and graceful proportions. The colour of the specimen, as we have it dead, is of a brimstone-yellow, longitudinally striped with dark blue along the dorsal surface and on the sides of the pleon.

MACROBRACHIUM FORMOSENSE, sp. nov. (Plate XXXI. fig. 1.)

Carapace about one-third the length of the animal, having a rostrum nearly half the length of the carapace, armed above with eleven teeth, two of which are behind the orbital margin of the carapace, and furnished with short, stiff hairs between the teeth. Inferior margin smooth, fringed with short hairs. Behind the margin of the lower angle of the orbit is a sharp anteriorly pointed tooth, and obliquely behind and below is a second similar tooth. First pair of antennæ having the peduncle rather shorter than the rostrum, the first joint of which is about half the length of the peduncle, concave upon the upper surface, and furnished with a sharp distal tooth on the distal outer angle, and a row of hairs along the outer margin. The smallest branch of the flagella is united to the largest for about one-tenth of an inch. Second pair of antennæ having the squamiform appendage reaching beyond the rostrum, and armed subapically on the outer side with a short, sharp tooth. First pair of pereopoda slender, long, having the carpus longer than the meros, and three times as long as the propodos. Second

pair of pereopoda half as long again as the animal, having the carpus longer than the meros and as long as the propodos, excepting the digital process; digital process curved slightly inwards, fringed with a row of hairs, and furnished with two dental tubercles within the centre. Dactylus curved; the apex crossing the extremity of the digital process of the propodos, and impinging against it through the entire length, fringed with a row of hairs and with a single tubercle. The entire appendage covered with small, yellow, transparent, spinous denticles. Last three pairs of pereopoda moderately robust, and furnished with numerous small denticles along the inferior margin. Posterior pair of pleopoda roughened with small spines, as also the telson, which carries a small fasciculus of hairs near the base, and two small sublateral spines beyond the middle.

The length of this species is about 4 inches. It has recently been taken and brought home by Dr. Collingwood, who procured it from the River Tamsuy, in the Island of Formosa.

*MACROBRACHIUM GANGETICUM*, sp. nov. (The Chingra.)

This species appears closely to resemble the preceding. I only know it through a drawing given to me by the late Colonel Hamilton Smith, who obtained it from a friend at Patna, a distance of 250 miles from Calcutta, where it was used as food, and was known under the name of "Chingra," the Hindostanee, I believe of "shrimp." Its length is about 6 inches, and the colour a bluish grey.

*MACROBRACHIUM LONGIDIGITUM*, sp. nov. (Plate XXXI. fig. 2.)

Carapace, including rostrum, nearly half as long as the animal. Rostrum about half as long as the carapace; upper surface armed with eight teeth, two only of which are behind the orbital margin. The teeth are widely separated from each other, and a few hairs are situated immediately anterior to each denticle. The lower margin armed with five teeth and a copious fringe of hair.

First pair of antennæ having the peduncle one-third shorter than the rostrum, the first joint of which is about half the length of the peduncle, concave upon the upper surface, and armed with a sharp distal tooth on the outer angle, and without conspicuous cilia along the margin. The smallest branch of the flagella attached to the largest for about one-fourth of an inch from the base. Second pair of antennæ as long as the animal, the peduncle being about half the length of the peduncle of the upper pair. Squamiform appendage not reaching to the extremity of the rostrum, and armed subapically with a small, sharp tooth, that does not reach beyond the cilia that thickly fringe the distal and internal margin.

First pair of pereopoda long and slender, having the carpus longer than the meros, and three times as long as the propodos. Second pair of pereopoda not quite as long as the animal, having the carpus a little longer than the meros, and the propodos, inclusive of the digital process, as long again as the carpus, the dactylus being half the length of the propodos, being pointed and curved at the apex,

crossing when impinged against the curved margins of the digital process of the propodos, the entire appendage being thickly studded with small tubercles that appear generally to be ranged in longitudinal rows, of which those on the inner and lower sides are considerably the more prominent. Last three pairs of pereiopoda moderately robust, and furnished on the posterior margin of the propodos with a few equidistant solitary spines, and interspaced with hairs. Posterior pair of pleopoda having the denticle of the external plate not produced beyond the margin of the distal articulation. Telson smooth, slightly compressed, furnished with a depression and small fasciculus of hairs near the base, and two sublateral spines on each side beyond the middle.

The length of this species is about 5 inches. It has been in the collection of the Plymouth Athenæum for many years; but no habitat is recorded with it.

MACROBRACHIUM AFRICANUM. (Plate XXXI. fig. 3.)

Carapace half the length of the animal, rostrum depressed; apex slightly elevated, surmounted by nine small teeth, of which the anterior are the smaller, and only the posterior one behind the orbital arch; the interspaces furnished with short, stout cilia on the underside of the rostrum; near the apex are three small teeth; at the inferior angle of the orbit is a small, sharp tooth, between which and the infero-anterior angle of the carapace is a suture that passes to a considerable depth into the carapace, but its limit is not defined by a spine as is very generally the case in this genus. The superior antennæ have the peduncle nearly as long again as the rostrum, having the first joint as long as the other two, concave upon the upper surface, and produced into a strong spine upon the outer distal extremity. The smallest flagellum united with the largest to about one-eighth of an inch from the base. Inferior antennæ one-fourth longer than the animal; squamous process internally distended near the middle, receding towards the apex, which reaches nearly for one-half its length beyond the peduncle of the superior antennæ, and subapically armed with a tooth on the upper and outer side. First pair of pereiopoda are slender, and have the carpus longer than the meros, and four or five times as long as the propodos. Second pair of pereiopoda unequal, the right being considerably more long and robust than the left; but otherwise they resemble each other. The right leg as long as the animal, the left about one-third shorter; carpus about half the length of the propodos, minus the digital process, in the right, but nearly as long as the propodos in the left. Meros longer than the carpus, and both right and left thickly covered with sharp anteriorly directed spinous tubercles. Dactylus and digital process long and slender, armed at the extremity with a distinct spine, and along the inner margins with three corresponding tubercles. Posterior three pairs of pereiopoda robust, and furnished with numerous small spines on the dactylus and posterior margin of the propodos. Posterior pair of pleopoda having the articulation of the outer plate waved, and the denticulated process continuous

with the outer margin of the second articulate margin ciliated, extremity of both plates round. Telson smooth, laterally slightly compressed; near the base on the central dorsal surface is a depression occupied by a small tuft of hair, and beyond the middle, on each side, are two short spines and a fasciculus of short hair.

*Hab.* Tambo River.

The near resemblance that these species bear to those of the genus *Palæmon* may induce some carcinologists to reconsider the propriety of making these species a genus by themselves. I am not aware that any structural distinction separates them from the genus *Palæmon*. There is, I think, however, in the enormous length of the second pair of pereopoda, when compared with the same appendage in *Palæmon*, a strong *primâ facie* evidence that a separate generic distinction would form a very natural classification. I had, I must admit, some doubts upon the question, and hesitated in my opinion until I found that others, though closely allied in general form, yet specifically distinct in character, enabled me to see that the peculiarly distinguishing features that separated the species of this genus from *Palæmon* were sufficiently constant to warrant the adoption of the new genus. The convenience of this arrangement may also be seen in the peculiar and distinct habitat of *Macrobrachium*, the whole of the species yet known being lacustrine or fluviatile. I have only seen one or two specimens of each species, and these are all males. The development of the chelopods is so great in length that it must be difficult, if not impossible, for the animal to reach its own mouth with them; so that they can be of no use in feeding, for which purpose the first pair, being shorter, are more efficient. I believe it probable, but have not been informed, that in the females the chelopods are less monstrously developed.

It is something very remarkable that these Prawns, all of them so very large, living in freshwater lakes and rivers, in localities so very distant from each other as Central America and Central India, should bear so near a resemblance.

We are not aware that the same rivers or lakes have any other species of Prawn; and it would appear that the several species must have come from one common origin; for even the position and number of the spines on the telson, as well as the fasciculus of hair in the small depression at the base of the same, are common to all the species.

Whether or not there is anything remarkable in the form of their young or in the development of their larvæ I know not. The freshwater *Astaci* differ from their marine congeners in producing the young in a more advanced stage of development; but this appears not to be a constant law in freshwater Crustacea. In a small freshwater Prawn from the rivers of the island of Mauritius, that has been sent to me by Dr. Power, the young undergoes a change of form similar to that of the marine species.

I look upon the discovery of these edible Crustacea as being

among the most fortunate of recent carcinological observations. Their great size would well adapt either of the species for culinary purposes if any one could be induced to acclimatize the species to our own lakes and streams. This appears to be the more easy in regard to the species from America, since the Lake Amatitlan is at so lofty an elevation as to be of a very low temperature.

## DESCRIPTION OF PLATES XXX. &amp; XXXI.

## PLATE XXX.

*Macrobrachium americanum*. c. Rostrum. b. Superior antennæ. c. Inferior antennæ. d. Mandible. h. First pair of pereopoda. v. Posterior pair of pleopoda. z. Telson.

## PLATE XXXI.

- Fig. 1. *M. formosense*. c. Scale of inferior antennæ. v. Posterior pair of pleopoda. z. Telson.  
 2. *M. longidigitum*. c. Scale of inferior antennæ. v. Posterior pair of pleopoda. z. Telson.  
 3. *M. africanum*. c. Scale of inferior antennæ. v. Posterior pair of pleopoda. z. Telson.

5. On a supposed new species of *Galeocerdo* from Southern Seas. By J. D. MACDONALD, M.D., F.R.S., and Mr. CHARLES BARRON, Curator of the Haslar Museum.

(Plate XXXII.)

The following observations on a species of *Galeocerdo*, from the Australian coasts, are based on two jaws and a portion of skin preserved by F. M. Rayner, Esq., Staff-Surgeon, R.N., together with notes and measurements made by him, and drawings made by Dr. J. D. Macdonald, R.N., from the recent animal.

On reviewing the literature of the genus *Galeocerdo* it would appear that, comparatively, few specimens have actually been obtained for scientific examination, as the great authorities on this group of fishes, Müller and Henle, only mention two examples of the southern Tope (*G. tigrinus*), and two of the northern (*G. arcticus*), with several jaws; and the British-Museum Catalogue of the *Chondropterygii* only includes one specimen of the former and three jaws of the latter species.

When we compare the external characters of the two known species, as given and depicted by Müller and Henle, with those of the present Shark, we find the proportions of the body and fins of *G. arcticus* (Müller and Henle, pl. 24) to agree best with it; but in the colour of the skin there is great difference, and the scales represented in the plate alluded to are approximated and slightly imbricated, besides being relatively broader and more distinctly three-keeled than those of our fish. Moreover, although the teeth figured